

We are told by newspaper correspondents that to this physical gift Mr. Bishop has added the power of reading and getting pictures of his subjects' thoughts, and now Dr. Carpenter endows him with the power of controlling the wills of his subjects, or—"may" teste—with some unnamed power still more mysterious. To Mr. Bishop as the successor of the Westminster whale or of Master Pongo, no one can have the slightest objection. Mr. Bishop as a *great* scientific phenomenon will, I fear, require better backing than the *careful testing* of Dr. Carpenter, and letters of introduction from scientific and medical men in Edinburgh who received Mr. Bishop, and in their turn gave him letters of introduction as a clever conjuror who performed by mechanical means feats of strength and agility attributed by spiritualists to their immaterial familiars.

THOMSON WHYTE

Merchiston Castle School, Edinburgh, July 2

### Mind-Reading versus Muscle-Reading

SEVERAL years ago I had the opportunity of witnessing in a private circle of friends some experiments on so-called "thought-reading," even more striking than those recently described in your columns and elsewhere. An attentive observation of these experiments led me to question the accuracy of that explanation of the phenomenon with which Dr. Carpenter has made us so familiar, namely, unconscious muscular action on the one side, and unconscious muscular discernment on the other. After making the most extravagant allowances for the existence in some persons of a muscular sense of preternatural acuteness, here still remained a large residuum of facts wholly unaccounted for on any received hypothesis. These facts pointed in the direction of the existence either of a hitherto unrecognised sensory organ, or of the direct action of mind on mind without the intervention of any sense impressions. Such startling conclusions could not be accepted without prolonged and severe examination, and it was solely in the hope of stimulating inquiry among those who had more leisure and more fitness for the pursuit than myself that I published the brief record of my experiments which, some years ago, brought derision and denunciation upon me. As no physiologist came forward to give the subject the wide and patient inquiry it demanded, I went on with the investigation, and for five years have let no opportunity slip which would add to the information I possessed. A letter addressed to the *Times*, asking for communications from those who had witnessed good illustrations of the "willing game," brought me in, at the time referred to, a flood of replies from all parts of England, and down to the present time fresh cases are continually coming under my notice. Each case that seemed worthy of inquiry was, if possible, visited and investigated either by myself during the vacation, or by a friend on whom I could rely. It is true that many long journeys have been taken and much time has been spent without a commensurate reward, but this was to be expected. Still, after casting out cases which might or might not have been due to "muscle-reading," there remained abundant evidence to confirm my belief in the insufficiency of Dr. Carpenter's explanation. Until this evidence is published, which it will shortly be, and the accessible cases are examined and reported upon by a competent and impartial committee, I simply ask the public to suspend their judgment on this question. And to show that this is not an unreasonable request on my part, I here give a few particulars of a remarkable case which reached me only a few months ago, and was carefully investigated by myself last Easter.

A clergyman in Derbyshire has five young children, four girls and one boy, aged from nine to fourteen years, all of whom are able to go through the ordinary performances of the "willing game" rapidly and successfully, *without the contact of the hands or of any communication besides the air between the person operating and the subject operated on*. More than this, letters and words, or names of places, of persons, and of cards, can be guessed with promptness and accuracy; the failures in any examination not amounting to one in ten consecutive trials. The failures, I am assured by the father—and there is no reason to doubt his veracity—form a far smaller fraction when the children are not embarrassed by the presence of strangers; for example, the parents assured me that their children, before I arrived, told correctly seventeen cards chosen at random from a pack, without a single failure, and after that correctly gave the names of a dozen English towns indiscriminately selected. I will however only ask attention to what came under my own observation, which in brief was as follows:—

One of the children, Maud, a child of twelve, was taken to an adjoining room, and both the doors between fastened. I then wrote on paper the name of some object *not in the room* (to prevent unconscious guidance by the eyes of those who knew the thing selected), and handed this paper round to those who were present. Not a word was allowed to be spoken. I myself then recalled the child, placed her with her back to the company, or sometimes blindfolded her before bringing her into the room, and put her in a position where no whisper or other private communication could reach her undetected. In from two to twenty seconds she either named the object I had written down (the paper, of course, being concealed) or fetched it, if she could do so without difficulty. Each child was tried in succession, and all were more or less successful, but some were singularly and almost invariably correct in their divination of what I had written down; what was more curious, the maid-servant was equally sensitive. This led me to try other experiments with those who knew the words chosen: and the father was found to be pre-eminently the best willer, and to be in fact almost as necessary for success as the sensitive "guesser"; further experiments showed that a battery of minds, all intently fixed on the same word, was far more successful than one or two alone. Apparently a *nervous induction* of the dominant idea in our minds took place on the passive mind of the child, and the experiments recalled the somewhat analogous phenomena of electric and magnetic induction. There seemed to be a veritable exoneural action of the mind.

I am quite prepared for the chorus of sceptical laughter which will greet this statement. That there should be disbelief is quite natural; a desire for further inquiry is all I ask for. To those who, with a single eye for truth, even if it be in collision with received opinions, are anxious to know if every possibility of error or deception was removed, permit me to add the following additional experiments. Instead of allowing the child to return to the drawing-room, I told it to fetch the object as soon as it "guessed" what it was, and *then* return with it to the drawing-room. Having fastened the doors I wrote down the following articles one by one with the results stated: *hair-brush*, correctly brought; *orange*, correctly brought; *wine-glass*, correctly brought; *apple*, correctly brought; *toasting-fork*, wrong on the first attempt, right on the second; *knife*, correctly brought; *smoothing-iron*, correctly brought; *tumbler*, correctly brought; *cup*, correctly brought; *saucer*, failure. On being told this object the child said, "Saucer came into my head, but I thought you would never ask for that after asking for a cup, so I wasn't sure what it was." Then names of towns were fixed on, the name to be called out by the child outside the closed door of the drawing-room, but guessed when fastened into the adjoining room. In this way Liverpool, Stockport, Lancaster, York, Manchester, Macclesfield were all correctly given; Leicester was said to be Chester; Windsor, Birmingham, and Canterbury were failures. I might give many other similar trials, for I spent three long evenings testing the children; but these results and the attempts made to answer the many questions that at once started to the mind, such as the effect of distance, &c., must be left for the present. Meanwhile, at the suggestion of Mr. Romanes, I have arranged for a small committee of scientific experts to visit the family, and verify or disprove the conclusion to which I have arrived, which is certainly opposed to that drawn by Mr. Romanes from his experiments on Mr. Bishop (*NATURE*, vol. xxiv. p. 172). Whether Dr. Carpenter will find in this case "a precise confirmation" of everything he has said on the subject I cannot say.

W. F. BARRETT

July 3

### A Case of Slow, Sub-Tropical Discharge of Earth-Electricity, and the Sun Recognisant thereof

IN the course of yesterday afternoon, in the midst of a sky otherwise clear and exquisitely blue, a large cloud of unusual shape and character began to form in the upper regions of the atmosphere vertically over, but very far above, the southern slope and even most elevated mountain tops of Madeira, and remaining there, as it did, most fixedly more than half the day, so contrary to the locomotive habits of ordinary clouds, it soon attracted the attention, and presently the fears, of most of the inhabitants.

As seen from this place, between 1h. and 3h. p.m., there was little more than a single dense cloud of peculiarly rounded outline and somewhat elliptical figure, stretching from the western horizon to within 10° or 15° of the zenith; but as time advanced,

other and successively smaller clouds were formed directly under the first, having symmetrical and concentric outlines therewith, while the central vertical axis, which might be conceived as passing through the whole series, remained unchanged and fixed in space. This central fixity, too, of them all continued, together with the infinite smoothness of the outlines of all the smaller lower strata of cloud, although the largest and uppermost one visible to us began to put forth a variety of fringes of cirro-cumulus character; and, as tested by the spectroscope before sunset, all the lower smooth-rimmed clouds were remarkable for the large quantity of watery vapour they contained, and held fast too, for no rain fell. As sunset approached every one was gazing at the strange phenomenon of a cloud-congeries of most portentous size and absolute fixity above the trade-wind, probably also the anti-trade region; and after sunset the most gorgeous coloured illuminations through all the ranges of scarlet-red, red, crimson-red, ultra-red; and then dun-coloured and grey passed from member to member of the series, distinguishing the various heights of its strata one above the other; while the greatness of the general height was shown, even long after darkness had set in, by a faint lunar-like illumination of the northern outline of the whole. But by ten o'clock that began to fail, and the system of superposed clouds was beginning to contract on its central axis, and faded away, without leaving its place, before morning.

In so far we had been witnessing, though without any positive light of its own, a vertical series of disks of cloudy matter, extremely like the lower end of the successive, transverse, discous arrangements seen in a gas vacuum-tube of large dimensions, when the electric discharge from a powerful induction-coil is passing through it; and we were inevitably reminded thereby that the cosmical electric theory of M. Gaston Planté (of "secondary batteries or storage" fame) justifies an escape of the earth's interior electricity from time to time into planetary space, and more particularly to the sun.

Was there, however, in this case any symptom of the sun exciting, or calling for, any such discharge, and from this part of the earth?

The sun was undoubtedly in the Northern Tropic, and the highest northern declination for the year had just been reached; but for a fortnight or more past the solar spot manifestations had generally been weak, almost fading away. This I knew well, having taken a picture of the sun-spots every day (Sundays excepted) since I have been here. However, though the appearances were as poor as they well could be on June 21, 22, and 23, yet on Friday, June 24, there was a little improvement, some new, though small symptoms appearing in either solar tropic. On Saturday, June 25, these new features were confirmed and slightly increased. But what were they on Sunday, June 26, when the extraordinary cloud-arrangement was hanging so long above Madeira?

I, who am here merely as a private amateur in a different subject, know not; but on Monday morning, so early as 5h. 30m. a.m., I was astonished and delighted at the solar scene then presented. The spots first caught sight of on Friday were now well advanced and much developed; a new group with extensive double ramifications had also appeared in the same tropic nearer the equator; while finally, near the middle of the sun's disk in the south tropic, were two large spots, with connections extending over 60,000 miles in length of solar surface, and indicating more solar energy to have been thereby rapidly, if not suddenly, manifested within the last forty hours, than anything which I, at least, have witnessed for a very long time past.

PIAZZI SMYTH,  
Astronomer-Royal for Scotland

Jones's Hotel, Quinca do Corvalho,  
Funchal, Madeira, June 27

P.S.—The grand, and now circumpolar, comet was not neglected here on the same night.—P. S.

### Carbonic Acid Gas not Free in Sea Water

IN a short paragraph in *NATURE*, vol. xxiv. p. 176, it is stated that Tornö, in the Norwegian Deep-Sea Expedition, had found "carbonic acid both in a gaseous and basic form."

For some time past I have doubted whether there was any free carbonic acid gas in the deep water where pressure should make its presence felt. Lately, in a paper to the Royal Microscopical Society, I have demonstrated that if there is any carbonic acid in the sea water at great depths, its dissolving action is not equal in rapidity and intensity to that exercised by a

microscopic Thallophyte which bores into an *bissoles* sponge spicules from within. Moreover amongst deep sea deposits I find perfect organisms which have long been dead, which have been penetrated by parasites and covered here and there by foraminifera, and yet in exposed parts, the ornamentation is perfect. There is no evidence of erosion.

Now on carefully examining into Tornö's essay come to a different conclusion to the writer in *NATURE*, and find that the able Scandinavian denies the existence of free carbonic acid in the sea.

The following notes, which I made in abstracting Tornö's "Chemical" of the Norwegian North Atlantic Expedition, Part II., may be interesting:—

The carbonic acid gas, driven off by the process of boiling sea water, when collected, varied in a most marked manner; it was always appreciable, and the quantity was sometimes large. The pressure was that of the atmosphere. Under different conditions, and when the gases were boiled out in a vacuum created by steam, and of course at a lower temperature, the quantity of carbonic acid gas was often *immeasurably small*. Moreover the quantity varied.

Jacobsen, by distillation, succeeded in expelling the whole amount of carbonic acid contained in a quarter litre of sea water, and found that North Sea water contained 100 mgr. per litre. The neutral carbonates in the residuary deposit contained about 10 mgr. per litre. Hence a very small proportion of the carbonic acid driven off by distillation, could have been present in bicarbonates. Vierthaler had asserted that the carbonic acid in sea water was got out of the bicarbonates by boiling.

If the carbonic acid is free and absorbed by the sea water in a free gaseous form, it is remarkable that it should not be more readily got. Jacobsen supposed that sea water has a peculiar property of retaining its carbonic acid, owing to the presence of the chloride of magnesia. Buchanan was led to believe that most of the salts were in some degree distinguished by the property of determining the retention of carbonic acid in the sea. He especially insisted on the importance of the sulphates, and asserted the mean amount of carbonic acid present in the waters of the Southern Seas to be 43.25 mgr. per litre.

Tornö, following Jacobsen, found the amount of carbonic acid gas present in the water of the track of the northern cruise of 1877 to be about 100 mgr. a litre, but got 12 mgr. per litre as a variation in the amount.

He was struck with the improbability that sea water should possess so remarkable a power of retaining mechanically one gas and exert no corresponding influence on others, and then he found that sea water had an *alkaline reaction*. He began to believe that some of the neutral carbonates had been decomposed during the boiling, and had evolved much of the carbonic acid gas.

He then proved by experiment that the saline mixture in sea water, on the temperature being raised to the boiling point, decomposed neutral carbonates, and that all previous experiments with the object of measuring the carbonic acid in the sea water had been faulty. He was influenced by some experiments on the determination of carbonic acid gas in mineral water, and applied the method to sea water.

He found the total amount of carbonic acid gas in a specimen to be 97 mgr. per litre, and the proportion forming neutral carbonates to average about 53 mgr. The difference, 44 mgr., cannot occur free as gas, but will unite with the carbonates to form bicarbonates. Hence Jacobsen's experiments could be explained on the assumption that sea water contains no trace of free carbonic acid, but as much as 53 mgr. per litre forming carbonates, and only 44 mgr. forming bicarbonates.

On page 35 he states: "*If we bear in mind that sea water is an alkaline fluid which does not contain the smallest trace of free carbonic acid.*"

What a comfort this must be to globigerina and coral reefs!  
June 27 P. MARTIN DUNCAN

### Symbolical Logic

I AM afraid I share the proverbial obtuseness of my countrymen in the matter of jokes. I really did not at first see the point of Mr. Venn's humorous suggestion that "an attitude of slight social repression" should be observed towards troublesome authors of new proposals. Now however that Mr. Venn has kindly pointed it out to me (see *NATURE*, vol. xxiv. p. 140), I see the joke perfectly and can laugh at it heartily.